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Typhoid fever.

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TYPHOID FEVER:

RESTRICTION AND PREVENTION.

ISSUED BY

Connecticut State Board of Health.

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The rules for its restriction and prevention, in brief, are:

1. THOROUGHLY DISINFECT ALL INTESTINAL DISCHARGES FROM PATIENTS WITH TYPHOID FEVER.

2. Prevent pollution of water used for domestic purposes by faecal impurities from privy vaults or otherwise.

3. Prevent the pollution of the air and soil by filth, or the putrefactive decay of organic substances.

4. Secure a well drained site for a dwelling house, with sub-soil drainage around the outside of the cellar walls.

5. Carefully clean the cellar of all refuse at least every spring and fall, whitewash the walls, and ventilate thoroughly in summer.

The disinfectants most reliable, as well as cheap are—

1. Copperas, 50 pounds to a barrel of water. Four gallons will usually be sufficient for a vault used by one family; afterwards a smaller quantity daily; one pound to a gallon of water may be used.

2. Sulphate of zinc, 8 ounces; chloride of zinc, 2 ounces; water, 4 gallons.

3. For boiling cotton and linen goods, one part chloride of zinc to two hundred of water. Burnett's Fluid is a solution of chloride of zinc.

The two latter do not stain, and have no odor.

It is not intended to decide any of the mooted points upon the etiology of typhoid, but simply to state facts that are known.

RESTRICTION OF TYPHOID FEVER.

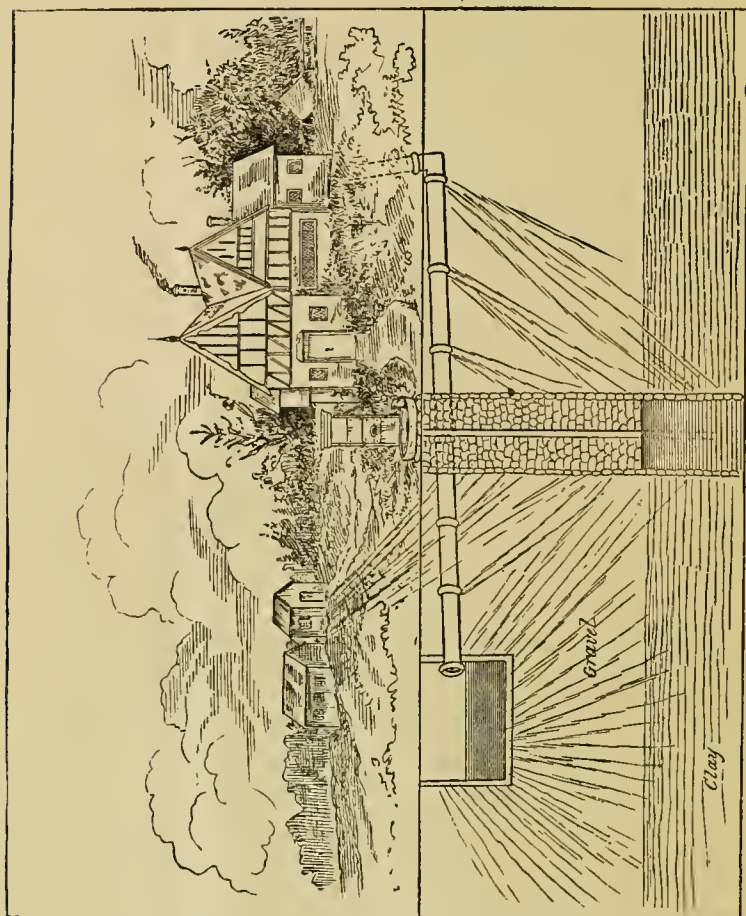
As typhoid fever is one of the endemic diseases of this State, often manifesting itself in local epidemics of greater or less extent and severity, it has seemed wise to endeavor to diffuse a little more certain knowledge concerning its causation and prevention.

Typhoid fever is a type of the group of diseases to which the name *filth-diseases* has been given; in brief these are thus named because they are spread by excremental filth and sewage, and rendered more malignant, if not directly produced. However disgusting it may be, it is doubtless true that typhoid fever may be received into the system by inhaling through the air we breathe, or swallowing in the water we drink particles of *fecal matter* that had their source in a patient sick with the typhoid fever. The evidence is conclusive that the choleraic dejections dried and scattered through the air by the winds have produced wide-spread epidemics of Asiatic cholera. No less conclusive is the evidence that the dejections of typhoid fever patients that have found their way to the air we breathe or the water we drink have, in numerous instances, caused cases and epidemics of typhoid fever. So plain is this evidence, that epidemics have been traced to the milk of the dairyman diluted with water thus contaminated, or, at least, the pans and utensils washed in such water, as in the epidemic at Parkhead, described by Dr. Russell. Near London, 500 cases were thus caused in 104 families, 96 of which were supplied with milk from one dairy; the cause was traced to milk thus infected by typhoid dejections from a patient in the dairyman's family. Instances might be multiplied to any extent. Milk has also been a vehicle for the conveyance of other diseases of this class, as diphtheria, for instance.

The cases where the well has been thus poisoned and become a vehicle for the transmission of this disease, would, if all collected,

fill a good-sized volume. An illustration of one or two, however, may be of service in fixing the facts in mind.

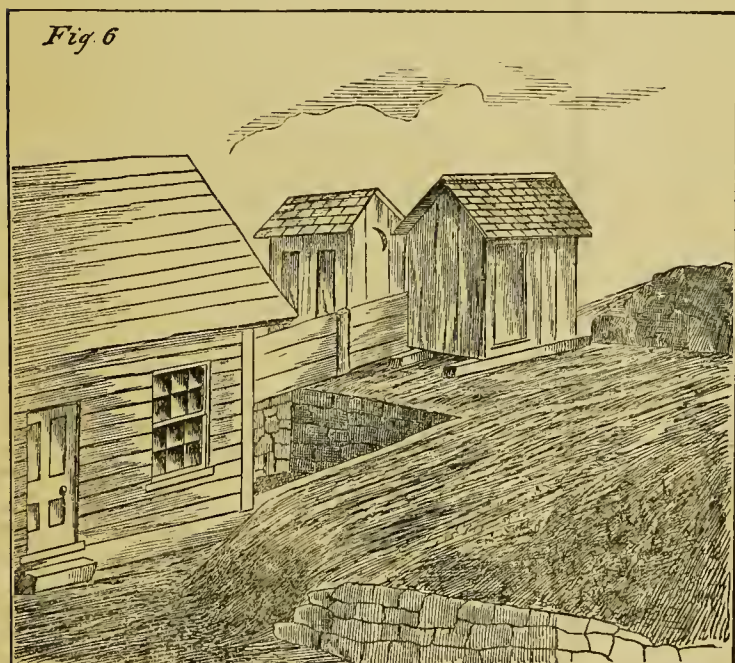
In the house shown in the following illustration, there was a severe, in fact fatal, case of typhoid fever; the dejections were



thrown sometimes into the cess-pool, sometimes into the privy-vault. It will be seen by the illustration that the drain leading to the cess-pool passes the well, and is laid with loose joints in a gravelly soil with a clay substratum. The water from the well was thus easily polluted from both sources. The water from this well was used by several neighboring families, and by relatives

who came several months later to visit the family, and by servants engaged for the increased summer work. In ten of sixteen who used the water of the well, typhoid fever ensued with a fatality much above the average.

The second illustration is of the apparent production of typhoid fever directly by filth. There was no traceable connection with any preceding case. The well is not shown here; it was on a level with the house, five or six feet lower than the privies, and about



equally distant from each; between them and the house. A fatal case of typhoid fever occurred here. It is difficult to eliminate contagion from a preceding case, as this may be preserved for years, and then act with, if anything, increased vigor. An instance of that was afforded lately, when the contents of a vault that had not been cleaned out for fifteen years, at least, was emptied, and the contents spread upon the land where a heavy rain washed portions into an adjacent well, the water from which started an epidemic. Near Stuttgardt the meadows were manured with sewage, rain washed the organic poison into the aqueduct, there was

at least one patient in every house using this water to drink, while there were no more cases than usual in other parts of the city.

It attacks all ages, but especially those in youth and the prime of life; hence, its ravages are most detrimental to the State. Eighteen in every one hundred attacked die; the mortality rapidly increases in persons over thirty as age increases. It appears in all seasons, but is more frequent in autumn. It has of late become more especially a disease of the country rather than the city, especially if the cities have an abundant supply of pure water, and are well sewered, otherwise we find typhoid fever as prevalent in the city as in the country. One attack is a partial protection against a second. Some persons and families are peculiarly liable to the disease.

The usual practice in villages, and even in large towns and cities, too often is to secure a supply of water for drinking and other domestic uses upon the premises, usually from a shallow well. In the small lot upon which the house stands,—and the larger the village the smaller is this building-lot,—three holes are dug in the porous soil; one is used as a privy-vault, one to receive all the waste and filthy liquids from the house, the other to pump drinking-water for the family; these are often but a few feet apart—ten or twelve feet is no uncommon distance—even if they are as far separated as the limits of the lot will allow, they are in many cases dangerously near, and similar receptacles on adjacent lots add to the evil. The privy-vault and cess-pool are seldom cleaned; often when the vault is full, a new site is selected near by and the old covered with a little earth, while the porous nature of the soil is relied upon for the latter; soil-pollution and contamination of the water is only a matter of time. To this must be added the soaking from surface-filth which drains into the well. Unfortunately, the soakings from excrement after passing through a few feet of soil do not render the water unpalatable, nor are germs or virus of disease separated, as shown by the numberless epidemics thus caused. The influence of decaying vegetable matters in the cellar must be added to the predisposing causes at least of typhoid fever. In a strictly sanitary view the cellar should not be used as a receptacle for vegetables and fruit in large quantities, especially when these are placed directly under living and sleeping rooms; more or less decay must of necessity take place,—the amount can only be estimated by the vast heap of refuse, half decayed and decaying vegetable materials, that are re-

moved in the spring. The gaseous emanations from this mass have been slowly devitalizing the air of the cellar during the winter; more or less of this cellar air finds its way into the rooms above. Still worse is the case when the cellar is neither cleansed nor ventilated in summer.

The sink drain and garbage heap in country houses are too often allowed to add their quota to the influence of other unhealthful surroundings. Too often fœcal matters are thrown upon the garbage heap, and if from a typhoid patient air and water readily become contaminated. The vile habit of throwing such matter from windows is not unknown. A little care in conveying the kitchen waste to a safe distance, or using it for sub-irrigation, as before described, will add much to health and comfort. The solid garbage can readily be composted at a distance from the house or well. These depressing influences are especially liable to affect little children who play around the house, and the surroundings should be pure.

POLLUTION OF SOIL AND WATER.

This can readily be prevented, if the waste products are used to nourish vegetable growth, instead of allowing them to accumulate in deep receptacles, where nature's processes are rendered inactive. Every house, almost, has lawn enough to dispose of the kitchen waste; if it were conducted a little below the surface in porous drain-pipes over the whole area, the grass-roots would soon render it harmless, nor would there be sufficient accumulation in winter to pollute the soil—or, the drainage from the sink could be conveyed to the garden and then led from point to point in shallow trenches, thus used as a fertilizer, instead of contaminating the sub-soil, which has but little power to dispose of filth satisfactorily. If a cess-pool be inevitable, the bottom and sides should be cemented; it should be well-ventilated, and often cleaned and emptied. The liquid contents may be conveyed by a drain leading away from the well and some distance above the bottom, so the solid matters may settle; these should be carted away.

The privy vault should be cemented, and ventilated by a pipe running to the roof of the building, and often emptied and disinfected. When emptied, lime may be used freely—the copperas solution is the best to disinfect and deodorize its contents, and should be freely used in the summer months. Where practicable, the use of dry earth is strongly recommended. The earth thus

used should be covered to keep dry, and if used freely can be used repeatedly. For indoor use in the country, especially in winter, the earth-closet is recommended. One can easily be improvised, and wood or even coal ashes used in place of dry earth.

The principal points may be thus summarized:

Typhoid fever is an infectious, self-propagating disease; the living body of the infected person is the soil in which the specific contagion which causes the fever breeds and multiplies.

The contagious matter by which typhoid fever is mainly perpetuated is cast off chiefly in the intestinal discharges. Privy vaults and other receptacles of these discharges become the medium of transmission of the specific poison.

Once cast off this contagion acts in two ways, either contaminating drinking water, which is the most deadly form of all fever poisoning, or infecting the air.

On account of the vitality of the contagion, its minuteness, and the multitude of ways in which it may be transmitted, it is often untraceable from one case to another. By destroying the infective nature of the discharges the spread of the disease may be prevented.

The discharges infect the air of the sick-room, the bed and body-linen of the patient, the privy-vault or other receptacle into which they are thrown.

A rubber sheet should be placed under the linen sheet, over the mattress, to prevent the discharges from infecting the mattress, as well as for cleanliness. The hands of attendants may be washed in the zinc solution or bromo-chloralum.

Thorough ventilation of the sick-room is of the greatest importance. The dresses of nurses and attendants should be disinfected after the termination of the case.

In case of death in epidemics the body should be at once placed in the coffin and disinfected. It may be wrapped in a sheet wet with a solution of chloride of zinc.

Cases of fever do appear where the evidence is apparently conclusive that they were caused directly by filth, without the intervention of a previous case. These are often called cesspool fevers, but they do not differ essentially from typhoid.



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